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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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09/551,027 04/17/00 NOBLE

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EXAMINER

TRINH, M

ART UNIT

PAPER NUMBER

2822

DATE MAILED:

12/21/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

| | |
|------------------------------|-------------------------------------|
| Office Action Summary | Applicant(s) NOBLE ET AL. |
| | Art Unit 2822 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- | | |
|---|--|
| 15) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 18) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 16) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 19) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 17) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3</u> | 20) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

*** Preliminary Amendment filed 4/17/00 has been entered as paper number 2/A. Claims 1-19 were canceled. Claims 20-26 are currently pending.

Specification

1. The disclosure is objected to because of the following informalities: specification is inconsistent in naming of "first source/drain region" and "second source/drain region". For example, specification page 4, line 26, (also claims 20-26) described "plate...integral with the first source/drain region" while specification page 9, last line through page 10, especially page 10, lines 13-14, inconsistently described "plate...integral with the second source/drain region". Suggestion is: changing from specification page 9, last two lines to other subsequent page, "first source/drain region 206" to --first source/drain region 210-- (not 206), and "second source/drain region 210" to --second source/drain region 206-- (not 210).

Appropriate correction is required

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 20,21,23-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Gotou (5,001,526).

Gotou teaches a method for forming a semiconductor device comprising at least the steps of: forming a number of access transistors, each access transistor formed in a pillar of semiconductor material that extends outwardly from a substrate wherein the access transistor includes a first source/drain region 15, a body region 14/16 and a second source/drain region 17

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formed vertically thereon (Fig 3b; or 68,73,67 in Fig 2; cols 4-6); forming a trench capacitor, wherein a first plate (15 in Fig 3b; or 68 in Fig 2) of the capacitor is integral with the first source/drain region 15 or 68, wherein a second plate (69 in Fig 2; or 21 in Fig 3b,10,11a-b, re claim 21) surround the first plate forming a grid pattern (Figs 2,3a-b,9a-b,11a-b,14a-b; re claim 23) by depositing polysilicon in row and column trenches (col 5, lines 22+); forming a number of word lines in a number of trenches that separate adjacent rows of access transistors, wherein each trench includes two word lines (30 in Fig 3b; or 63 in Fig 2) with a gate of each word line interconnecting alternative access transistors on opposite sides of the trenches; and forming a number of bit lines 29 (figs 3b, 1,14a-b) that interconnect second source/drain regions 17 of selected access transistors. Re further claims 25-26, forming layers and etching the layers to form column bars of a first source/drain region, the body region, and the second source/drain region, and row and column isolation trenches are described from figures 6 to 14b, and filling the trenches with a conductive material not to exceed the lower level of the body region 16 is shown in figure 15b, and wherein bit lines to interconnect the second source/drain regions is shown in figures 14a-14b, wherein the first source/drain region extending outwardly from the substrate.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

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5. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gotou (5,001,526) taken with Kimura et al (5,177,576).

Gotou teaches a method for forming a memory array as applied above to claims 20,21,23-26.

Gotou lacks to form a contact to couple the second plate to an underlying semiconductor layer.

However, Kimura et al teach (at fig 4, figs 6G-6M; col 6, lines 30-68) to form a contact at the bottom of the trench so that the contact couples a second plate to an underlying semiconductor layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a contact at the bottom of the trench so that the contact couples a second plate to an underlying semiconductor layer, as taught by Kimura because of the desirability to form an electrical connection between the second plate and the semiconductor wafer, wherein forming the contact directly at the bottom of trench for connection would miniaturize a device size.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 20-26 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-7 of U.S. Patent No. 6,156,604, or claims 1-22 of U.S. Patent No. 6,156,607. Although the conflicting claims are not identical, they are not patentably distinct from each other because this present application and the Patent are drawn

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to the same invention, in which scope of claims 20-26 of the present application are broad enough to encompass the scope of claims of the Patents 6,156,604 or 6156,607, and would have been obvious to skill artisan.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael M. Trinh whose telephone number is (703) 308-2554. The examiner can normally be reached on M-F from 8:30 Am to 4:30 Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Whitehead Jr Carl can be reached on (703) 308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.
Oasc



Michael Trinh
Primary Examiner